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Pesticide Fact Sheet Number 65: Dinocap

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

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EPA

Pesticide Fact Sheet

Name of Chemical: DINOCAP
Reason for Issuance:
Date Issued: June 30, 1978
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Background

- Rohm & Haas is the basic producer of technical dinocap and has produced it for over 30 years.
- Dinocap is the common name for this protectant and eradicant fungicide, used to control powdery mildew diseases; it also has limited use as a miticide.
- It is also known under the registered trade names of Karathane®, Crotothane®, Arathane®, Isolothane®, Mildex® Caprane®
- Apples are the major use site accounting for over 90% of use. Pears and grapes constitute most of the remainder. About 1% is divided among home garden, greenhouse, and a variety of fruits and vegetables.

Concerns

- Recently submitted teratology studies conducted on rabbits demonstrate increased malformations in offspring.
- Dietary exposure does not appear to be a concern.
- Dermal contact is the primary exposure route of concern.
- Mixer/loader and applicator exposure/risk assessments suggest that there may be no margin of safety to offspring of female applicators and mixer/loaders. Exposures from handling and applying dinocap for agricultural and home garden use are of concern.

Ongoing Studies

To characterize dinocap's potential to cause teratogenic effects from dermal exposure Rohm & Haas has agreed to conduct and submit the following studies by March 1, 1985 for EPA review:

- Teratology range-finding study on rabbits using the dermal route of exposure (to determine proper dose levels for the definitive dermal study).
- Teratology study on rabbits using the dermal route of exposure.

- Mixer, loader, applicator exposure study.

- Dislodgeable residue study (how much residues a worker would be exposed to while working with treated crops in the field).

- Oral and dermal pharmaco-kinetic and metabolism study in female rabbits (how the pesticide is transported in the body).

Regulatory Position

- EPA is initiating a Special Review of dinocap products.

- Rohm and Haas has taken a number of voluntary actions:

    - The manufacturer has voluntarily suspended the further marketing of their dinocap pesticide products in the United States until April 1, 1985;

    - The manufacturer has initiated an education program to inform its customers (other formulating companies), state and local regulatory agencies, apple grower associations, and distributors of the company's decision and the reasons for the actions taken;

    - The manufacturer has cautioned its customers against using dinocap products already on the market for home/garden and greenhouse use until EPA completes its evaluation of ongoing studies;

    - The manufacturer has offered to buy back all unformulated products for the home/garden and greenhouse use;

    - The manufacturer has waived all FIFRA indemnity and disposal payments from EPA should the agency decide to suspend registration.

Dipropetryn is not acutely toxic by the oral, dermal, and eye irritation routes of exposure. The available data are insufficient to show that any of the risk criteria listed in § 162.11(a) of Title 40 of the U.S.Code of Federal Regulations have been met or exceeded for the uses of dipropetryn at the present time. There are no valid chronic toxicity and mutagenicity studies for dipropetryn. There are also extensive residue chemistry and environmental fate data gaps.

Available data indicate that dipropetryn is slightly toxic to birds and moderately toxic to fish and freshwater invertebrates. A detailed ecological hazard assessment cannot be made until certain environmental chemistry data requirements are fulfilled.

Chemical characteristics:

Dipropetryn is a solid at room temperature. Its molecular weight is 255.40. The melting point is 104-106°C. Dipropetryn is soluble in water (at 20°C) to 16.0 ppm and soluble in aromatic and chlorinated hydrocarbon solvents.

Toxicological characteristics:

Acute toxicity effects of dipropetryn are as follows:

Acute Oral Toxicity in rats: >2,197 mg/kg body weight, Toxicity Category III
Acute Dermal Toxicity in rabbits: >10,000 mg/kg body weight, Toxicity Category IV
Acute Inhalation Toxicity in rats: >320 mg/l (4 hour exposure) Toxicity Category IV
Skin irritation in rabbits: Not an irritant, Toxicity Category IV
Eye irritation in rabbits: Not an irritant, Toxicity Category IV.

Subacute toxicity effects on dipropetryn are as follows:

A 19-week rat feeding study and a 14-week dog feeding study indicated effects on various organs at 1200 ppm dosage (the Lowest Effect Level). The No Observable Effect Level is 400 ppm.

Chronic toxicological effects of dipropetryn have not been evaluated because there are no valid chronic toxicity studies in both the rat and dog, oncogenicity studies in both the rat and mouse, teratogenicity studies in both the rat and rabbit, a two-generation reproduction study in the rat; a general rat metabolism study; and no mutagenicity tests (gene mutation in bacteria, gene mutation in mammalian cells in culture, chromosomal aberration analysis in mammalian cells in culture, or DNA damage in mammalian cells in culture).

Major routes of human exposure:

Non-dietary exposure to dipropetryn by a farmer as an applicator during mixing, loading, spraying and flagging is possible.

Physiological and biochemical behavioral characteristics:

Absorption characteristics: Dipropetryn appears to penetrate foliage rapidly, minimizing removal from foliage by rain.
Translocation: Readily translocated through the xylem from roots and foliage, accumulating in the apical meristems and leaf tips.
Mechanism of pesticidal action: Dipropetryn inhibits photolysis of water in the photosynthetic process.
Metabolism in plants: In cotton, dipropetryn's total residues are evenly distributed in the seed with crude oil extracts containing less than the intact seed.

Environmental characteristics:

Adsorption and leaching in basic soil types: Dipropetryn is more readily adsorbed on soils with high clay and organic matter content. Dipropetryn and other alkylthio-s-triazines are adsorbed to a greater extent than most other commercial triazines.
Microbial breakdown: Soil microorganisms do appear to play a significant role in degradation of dipropetryn.
Loss from photodecomposition and/or volatilization: Slight losses.
Average persistence at recommended rates: When used at recommended rates under normal environmental conditions, dipropetryn's residual activity is from 1 to 3 months.

Ecological characteristics:

Avian acute oral toxicity: >1,000 mg/kg.
96-hour fish toxicity): 3.130 ppm for bluegill sunfish (moderately toxic), and 2.430 ppm for rainbow trout (moderately toxic).

Potential problem for endangered species:

The Agency has evaluated dipropetryn under the cotton cluster/use patterns. Available data show a low order of dipropetryn toxicity suggesting that the potential hazard to endangered species is low.

Currently, there are no identifiable endangered plants that would be affected by dipropetryn.

The Agency believes that the conventional labeling for dipropetryn is adequate to properly inform the users on how to protect any endangered species.

Tolerance assessments:

Data are not available for calculating the Acceptable Daily Intake (ADI) for dipropetryn.

The Agency is unable to complete a full tolerance reassessment because the available dipropetryn toxicology and residue data do not fully support the established tolerance listed below. The metabolism of dipropetryn in animals and plants is not fully understood. Therefore, the Agency is requiring data on the metabolism of dipropetryn and related metabolite(s) in crops and animals. Additional long term rodent and nonrodent toxicological studies are also required. The additional data will be used to assess dietary exposure to dipropetryn and may lead to revisions in the existing tolerance. The Agency will not grant any significant pending or new tolerances for dipropetryn until the data are submitted.

Commodities	Parts per million
Cottonseeds	0.1

International Tolerances

Presently, there are no tolerances for residues of dipropetryn in Canada, Mexico, or in the Codex Alimentarius.

Problems known to have occurred with use:

The Pesticide Incident Monitoring System (PIMS) does not indicate any incident involving agricultural uses of dipropetryn.

4. Summary of regulatory position and rationale:

Based on the review and evaluation of all available data and other relevant information on dipropetryn the Agency has made the following determinations:

The available data are insufficient to show that any of the risk criteria listed in § 162.11(a) of Title 40 of the U.S.Code of Federal Regulations have been met or exceeded for the uses of dipropetryn at the present time.

The Agency has concerns about dipropetryn's lack of chronic toxicity data and its use on a food and feed crop when it is structurally related to certain other s-triazine pesticides which are known to be potential ground water contaminants and to cyanazine, a s-triazine pesticide that may be regulated as a teratogen.

The Agency will not allow any significant new uses to be established for dipropetryn until the toxicological, residue chemistry, and ground water data deficiencies identified in the registration standard have been satisfied.

The Agency is imposing restrictions on rotational crops. The extent of the restrictions will be reconsidered when additional data are received.

Specific label precautionary statements:

Hazard Information

The human precautionary statements must appear on all manufacturing-use products (MPs) labels as presribed in 40 CFR 162.10.

Environmental Hazard Statements

All MPs intended for formulation into end-use products (EPs) must bear the following statements:

"This pesticide is toxic to fish. Do not discharge effluent containing this product directly into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in a National Pollutant Discharge Elimination System (NPDES) permit. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the Environmental Protection Agency".

"Do not apply directly to water. Do not contaminate water by cleaning of equipment or disposal of wastes. In case of spills, cover or incorporate spills."

Restrictions on Rotational Crops

"Do not plant food and feed crops in dipropetryn-treate fields unless dipropetryn is authorized for use on thos crops".

5. Summary of major data gaps and due dates:

The following toxicological studies are required:

A 90-day inhalation study (October 30, 1986),
Chronic toxicity studies and oncogenicity studies (September 30, 1989),
Teratology studies (October 30, 1986),
A two generation reproduction study (October 30, 1988),
Mutagenicity data (April-July 1986), and
A general metabolism study (July 30, 1987).

The following environmental fate data are required:

A hydrolysis study (April 30, 1986),
Photodegradation studies in water and on soil (April 30, 1986),
Metabolism tests in aerobic soil and in anaerobic soil (October 30, 1986),
A mobility test involving leaching and adsorption/desorp tion (July 30, 1986),
Accumulation studies on rotational crops (confined: October 30, 1988 and field: September 30, 1989), and
An accumulation study in fish (July 30, 1986).

The following ecological effects data are required:

Two subacute dietary studies (April 30, 1986), and
An acute freshwater invertebrate toxicity study (April 30, 1986).

Product chemistry data are required during 1986.

The following residue chemistry data are required:

Additional plant metabolism data (July 30, 1987), and
Metabolism studies utilizing ruminants and chickens (January 30, 1987).

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